

REMARKS

Favorable reconsideration of the present application is respectfully requested.

Claims 3, 5, 6 and 9 have been allowed. Claims 3, 5, 6 and 9 have been canceled, and the subject matter thereof has been rewritten in independent form as new Claims 11-14, respectively. Claims 1, 2, 4, 7, 8 and 10 have not been amended.

Briefly, the claimed invention is directed to a steering apparatus for a vehicle of the type having a steering mechanism that is mechanically separate from the steering wheel, a control, system that determines a target steered angle of the steered wheel based on a detected steering angle of the steering wheel, and a reaction force actuator which applies a reaction force to the steering wheel. Such a system may include an elastic member such as a torsion bar. In this case, however, the elasticity of the elastic member can create instability in the system. For example, referring to Figure 6 and lines 12-26 of page 5 of the present specification, the phase of the steering wheel angle is considerably delayed with respect to the angle at the secondary side 505 of the elastic member 508, resulting in instability and vibration.

According to a feature of the invention set forth in Claim 1, the steering wheel position detector in such a system is located at the secondary side, i.e., at a side with respect to the elastic member that is closer to the reaction force actuator. According to a related feature of the invention set forth in Claim 10, the object of detection by the steering wheel angle detector is a portion that is closer to the reaction force actuator than the torque detector is to the reaction force actuator. As is evident from the nonlimiting example of Figure 7, providing that the detected steering wheel angle θ_h is indicative of a position at or near the secondary side 505 bypasses the phase delay due to the elasticity of the elastic member 508, as is inherent in the Example of Fig. 6. This source of instability can therefore be minimized or eliminated.

Claims 1, 2, 4, 7, 8 and 10 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. patent 6,079,513 (Nishizaki et al.). The Examiner there allege that Nishizaki et al. includes an elastic member in the form of a “torsion bar 20” that couples a reaction force actuator M_2 to the steering wheel, wherein the “elastic member” 20 is located between the steering wheel and the reaction force actuator M_2 , and wherein a steering wheel position detector 24 is located at the secondary side of the “elastic member” 20. However, this rejection is respectfully traversed.

Initially, it is noted that Nishizaki et al. *fails to anticipate any of the claims because it lacks an explicit or inherent teaching of an elastic member.* The Examiner has alleged that element 20 of Nishizaki et al. is an “elastic member.” However, there is no description in Nishizaki of element 20 comprising an elastic member. Instead, element 20 is simply a column shaft that functions as a rotating shaft (col. 6, lines 60-61). There is no description in Nishizaki et al. that the column shaft 20 includes a torsion bar or some other elastic member. Accordingly, the claims are not anticipated by Nishizaki et al.

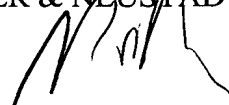
Nor would the claimed invention have been obvious to those skilled in the art in view of Nishizaki et al. As the Examiner has recognized, Nishizaki et al. discloses a normally used steering angle sensor 23 (col. 7, lines 50-53) which is located closer to the steering wheel 2 than to the motor M_2 . The other steering angle sensor 24, upon which the Examiner has relied in the rejection, is a fail safe sensor. Thus, Nishizaki et al. teaches that the location of the steering wheel angle detector is arbitrary and so would provide no motivation for one skilled in the art to position a steering angle detector at any particular location. Specifically, Nishizaki et al. provides no suggestion that locating a steering wheel position detector at the secondary side relative to an elastic member, or such that an object of detection is a portion that is closer to the reaction force actuator than the torque detector is to the reaction force actuator, is desirable to eliminate system instability or for any other purpose. Those skilled in

the art accordingly would have had no motivation to have modified Nishizaki et al. to include the claimed location of the steering wheel position detector relative to an elastic member.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early notice of allowability.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

Gregory J. Maier
Attorney of Record
Registration No. 25,599

Robert T. Pous
Attorney of Record
Registration No. 29,099

GJM/RTP/law
I:\atty\RTP\251893US-am.doc